

**Amendments to the claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application.

**Listing of claims:**

1. (Currently amended) A live attenuated strain of derivative of a pathogenic *Salmonella* species comprising

(a) a means for regulatable expression of a *fur* gene that encodes a regulatory protein, wherein a regulatable *araCP<sub>BAD</sub>* promotor that is operably linked to said *fur* gene, wherein said *fur* gene is expressed when said attenuated strain is in the intestinal tract of an individual and said *fur* gene is not expressed when said attenuated strain is within internal tissues of an individual and wherein non-expression of said regulatory *fur* gene protein in vivo causes synthesis of iron regulated outer membrane proteins (IROMPs) a first antigen that is conserved among *Salmonella* species and *E. coli* strains; and

(b) a means for regulating regulatable synthesis of an LPS O-antigen a first carbohydrate antigen, wherein said LPS O-antigen first carbohydrate antigen ceases to be synthesized in vivo, exposing an LPS core oligosaccharide a second carbohydrate antigen that is conserved among *Salmonella* species and *E. coli* strains;

wherein said attenuated strain derivative has enhanced ability to induce cross-protective immunity against *Salmonella* species and *E. coli* strains.

2. (Withdrawn and currently amended) The live attenuated strain derivative of claim 1, further comprising a mutation in a gene selected from the group consisting of *fliC* and *fliB* means for non-expression of a serotype specific antigen.

3. (Canceled)

4. (Withdrawn and currently amended) The live attenuated strain derivative of claim 2[[3]], wherein said mutation is a deletion mutation.

5.-8. (Canceled)

9. (Currently amended) The live attenuated strain derivative of claim 1 [[8]] wherein said means for regulatable regulating synthesis of an LPS O-antigen comprises a mutation in a gene that encodes a product necessary for synthesis of LPS O-antigen.

10. (Currently amended) The live attenuated strain derivative of claim 9, wherein said means for regulatable regulating synthesis of an LPS O-antigen comprises a mutation in the *pmi* gene.

11. (Withdrawn and currently amended) A method for inducing an immune response sufficient for protection against infection by *Salmonella* species and *E. coli* strains, said method comprising administering to an individual the live attenuated strain derivative of claim 1.

12-20. (Canceled)

21. (Withdrawn and currently amended) A vaccine comprising a live attenuated strain of *Salmonella*, wherein said live attenuated strain comprises comprising

(a) a mutation that renders a *pmi* gene non functional; and  
(b) a regulatable *araCP<sub>BAD</sub>* promoter operably linked to a *fur* gene wherein said *fur* gene is expressed when said attenuated strain is in the intestinal tract of an individual and said *fur* gene is not expressed when said attenuated strain is within internal tissues of an individual.

22.-25. (Canceled)

26. (Currently amended) The live attenuated strain derivative of claim 1, wherein said strain pathogenic-Salmonella-species is a *Salmonella typhimurium* comprising

(a) a *Δfur::T<sub>araCP<sub>BAD</sub></sub>*fur deletion-insertion mutation; and

(b) a  $\Delta pmi$  mutation.

27.-30. (Canceled)

31. (Currently amended) The live attenuated strain derivative of claim 1 [[30]], further comprising a  $\Delta pmi$  mutation.

32. (Currently amended) The live attenuated strain derivative of claim 1 comprising a  $\Delta pfur::araCP_{BAD}/fur$  genetic construction.

33. (Canceled)

34. (Withdrawn and currently amended) The live attenuated strain derivative of claim 1, further comprising a means for biological containment.

35. (Withdrawn and currently amended) The live attenuated strain derivative of claim 34, wherein said means comprises a mutation that abolishes motility, prevents synthesis of the exopolysaccharide folic acid, prevents synthesis of components of the bacterial extracellular matrix, reduces ability to withstand the stresses of stationary phase and starvation, reduces ability to use nucleic acids as a nutrient, or uncouples regulation of cellular activities from a dependence on protein synthesis.

36. (Withdrawn and currently amended) The live attenuated strain derivative of claim 35, wherein said mutation is selected from the group consisting of  $\Delta(gmd-fcl)-26$ ,  $\Delta agfBAC811$ ,  $\Delta bcsABZC2118$ ,  $\Delta bcsEFG2319$ ,  $\Delta adrA1418$ ,  $\Delta mlrA34$ ,  $\Delta yhiR36::TT$ ,  $\Delta endA2311$ , and  $\Delta relA1123$ .

37. (Withdrawn and currently amended) The live attenuated strain derivative of claim 35, wherein said mutation consists of a mutation in a gene selected from the group consisting of *gmd*, *fcl*, *agf*, *bcs*, *adr*, *mlr*, *yhi*, *end*, and *rel*.

38. (Withdrawn and currently amended) The live attenuated strain derivative of claim 1, further comprising a mutation in a gene selected from the group consisting of *sip* and *sop*.

39. (Withdrawn and currently amended) The live attenuated strain derivative of claim 38, wherein said mutation is  $\Delta sopB1925$ .

40. (Withdrawn and currently amended) The live attenuated strain derivative of claim 1, wherein said live attenuated derivative comprises the  $\Delta ilvG3::TtaraCP_{BAD} lacI$  genetic construction.